



26 July 2016

Donald N. Heirman
Chair
Don HEIRMAN
Consultants
732-741-7723
732-530-5695 (Fax)
d.heirman@att.net

Thomas J. Fagan
Vice Chair
Raytheon Missile
Systems
520-794-0227
tjfagan@ieee.org

Monrad L. Monsen
Secretary
Oracle
303-272-9612
monrad\_monsen@ieee.org

Meeting Announcement

Committee: TC-2; Electromagnetic Compatibility (EMC) Measurements
Place: The Shaw Centre Ottawa
Date: 26 July 2016 (Tuesday)
Time: 7:00 to 8:30 AM
Room: 203
Continental breakfast available

MINUTES

1.0 Call to Order/Introductions

Meeting was opened by Chair, Don Heirman, at 7:00AM. All in attendance introduced themselves and signed roster.

Table with 3 columns: Name, Company, Member. Lists attendees like David Arnett, Ross Carlton, Tom Fagan, etc.

2.0 Approval of 2015 Minutes from IEEE EMC TC-2 meeting (18 August 2015) in Dresden, Germany at the IEEE EMC and EMC-Europe Symposium

The Dresden TC-2 meeting minutes were approved.

3.0 Committee Membership Status

The chair read the following requirements for membership with no comment received.

3.1 Removal of non-active participants from membership roster.

Membership indicates that you have attended the TC-2 committee meeting at least two (2) or more times in the last four (4) years; candidates are shown as attending a single meeting on or after 2013 and no other. By committee rules, these candidates are not members of TC-2 unless they attend a second face-to-face symposium meeting within a four year period.

All attendees will initial the sign-in roster. After the Ottawa TC-2 meeting, those that have not attended a face-to-face TC-2 meeting since 2013 will no longer be a TC-2 member but will remain on the list for one additional year to receive meeting announcements. Those that have not attended a face-to-face TC-2 meeting since 2012 will be removed from the list. (See the 2016 membership list which is also the meeting sign-in roster.)

#### 4.0 Current Symposium Activity, July 2016

##### 4.1 Symposium paper review status (top paper, top TC-2 paper, Round 2 reviewing, etc).

For the technical program, TC2 reviewed 18 papers and accepted 13.

TC2 had 2 proposed workshop/tutorials, and both were accepted into the final program. TC2 had no special sessions submitted or accepted.

**ACTION Ottawa-1:** Secretary to send out an encouragement to TC2 members for more papers for IEEE EMC Symposium 2017 (Washington, DC).

#### 5.0 Standards Sponsorship Support Review

The standards list below was not fully addressed at this meeting due to time constraints that the chair had to manage. Here is where the list is given:

[http://www.emcs.org/standards/sdecom/Standards\\_Matrix.html](http://www.emcs.org/standards/sdecom/Standards_Matrix.html)

IEEE Standards that are mature, in review process, or need to be placed in review process. These EMCS standards are

139 (Measurement of RF for ISM equipment on user's premises)

187 (TV/FM spurious emissions)\*

299 (Shielding effectiveness of enclosures)

299.1 (Shielding effectiveness of enclosures with dimensions between 0.1 & 2m)

P370 (Characterization of PCB interfaces up to 50 GHz)\*

377 (Land mobile spurious)

473 (Site Survey)\* + work with ANSI C63 draft C63.24 (In-situ Immunity testing)

475 (Field disturbance sensors)

1128 (Absorber performance)\*

1140 (Near field LF emissions)

1302 (Gasket characterization)\*

1309 (Probes)

1560 (Filters in the range 100Hz to 10GHz)

1597 (Validation of Computational EM Computer Modeling and simulations)

1597.1 (Validation of computer modeling & simulation)

1642 (Intentional EMI)

1688 (Module testing)

P1848 (Techniques & Measures to Manage Risks with Regard to Electromagnetic Disturbances)\*

1897 (Resolution of Power Line Gap Noise Reports)

P2710 (Electromagnetic Shielding Performance of Enclosures for Portable Electronic Devices)\*

2716 (Board Level Shielding)

Study groups on planar shielding effectiveness measurement, shielding of PCB, and shielding of forensic bags/pouches

\* Standards topics addressed at this symposium with WG meetings

## 6.0 iNARTE Exam Question Review Activity

Now uses a list of professional question writers and reviewers. This year the exam is 80 questions (8 hours), but the exam will change to 40 questions (4 hours). iNARTE renewals will require professional education credits (not just a renewal fee).

## 7.0 Future Symposium Activity

### 7.1 Future topics for IEEE conferences in Washington, DC, on 4-12 August 2017.

Tom urged TC2 to encourage more papers to be submitted for future symposia. Like to see topics to include addressing drones and unmanned aerial vehicles (UAVs).

### 7.2 Technical Program Responsibilities and session chair reminders

If you would like to be on the paper review committee, please let Don know what your areas of expertise are so he can send appropriate papers to you for review. We attempt to have three people review each paper.

### 7.3 Paper Review Deadlines for 8/2017 (Washington)

Preliminary full paper manuscript is due by 16 Jan 2017.

Acceptance notification will be issued by 21 Feb 2017.

Final paper is due 3 May 2017.

### 7.4 Paper reviewers

TC2 members are welcome to be paper reviewers. Don has a reviewer list from the past. But there is always need for reviewers.

**ACTION Ottawa-2:** TC2 members interested, contact Don indicating what area of expertise you feel comfortable in being a reviewer.

### 7.5 Need session chairs

TC2 has four sessions. Don is chairing three. Dave Arnett co-chaired one with Don. Ghery Pettit and Bob Hoffman are co-chairs for the 4<sup>th</sup> session.

### 7.6 New membership

We are always looking for more members.

**ACTION Ottawa-3:** All attendees need to get the word out to everyone. This field has many new topics coming including initiatives to make WiFi available everywhere (balloons, solar powered gliders, etc.). Need to address interference.

### 7.7 New areas of interest

Don led a brainstorming session to look for more topics for workshops and even technical sessions.

### Suggestions

1. Might look at EMC measurement standards to de-conflict and harmonize. It would be nice to have more commonality between industries and product types. Limits might vary due to unique needs, but the measurement techniques should be more in common as TC2 does not address limits or test levels.

2. As we move to use higher and higher frequencies, we need to look at issues with making measurements at those higher frequencies. Don points out that FCC is investigating services that are using these frequencies: 60 GHz and 110 GHz. Clearly there will be need for measurements.

3. EE education needs to make students aware that there is no such thing as an ideal resistive only component (no ideal resistor having no inductance, etc.).

4. Noise floor is a good topic to address since FCC is asking about this. We might sponsor a joint session on this topic with another EMCS technical committee that uses signals near the noise floor or measurement equipment.

5. Two methods of testing. ANSI C63.4 has bore sighting the antenna, and CISPR keeps antenna horizontal and only height scan if EUT is tall ... look at 3dB beam width of antenna gain as it has been shown in some cases that the highest gain is at the 3 dB beam width edges and not the center axis of the antenna..

6. Sponsor a session to look at radiated electric field measurement methods above 1GHz.

7. Sponsor a session on radiated magnetic field measurements 9kHz to 150kHz.

8. Topic: Reverberation chambers (both emissions and immunity). Problem is how to correlate this method with open area test site measurements. Perhaps we give up correlation and just have a separate limit applied to the method.

9. Topic: Immunity like surge, EFT, ESD, conducted immunity, etc. It has been a long time since we have addressed these topics. ESD is worse in dry climates. ESD events like laptop being placed on a docking station has a significant discharge concern (See ANSI C63.16). Conducted immunity can be an issue for analog products. We could invite the key writers of those standards to speak in a session.

10. Topic: What is the real environment out there for voltage dips & interrupts (real power quality seen around the world), radiated immunity (field strengths experienced by products), etc. Is ring wave common? This kind of research could spur us to create more EMC measurement/immunity techniques to evaluate these kinds of stresses.

11. Need standards for harmonics for equipment above 75A.

12. In what order should immunity testing be performed?

## 8.0 Set meeting and agenda for next meeting(s)

### 8.1. Washington, DC area, 8 August 2017

## 9.0 Adjournment

Don thanked those in attendance and closed the meeting at 8:30 AM.

Monrad L. Monsen  
Secretary, IEEE EMC TC-2